U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Sphaeralcea gierischii*

COMMON NAME: Gierisch mallow

LEAD REGION: Region 2

INFORMATION CURRENT AS OF: April 2010

STATUS/ACTION

___ Species assessment - determined we do not have sufficient information on file to support a proposal to list the species and, therefore, it was not elevated to Candidate status
___ New candidate
_X__ Continuing candidate
___ Non-petitioned
_X__ Petitioned - Date petition received: 6/25/2007
__ 90-day positive - FR date: 11/9/2009
__ 12-month warranted but precluded - FR date: 11/9/2009
__ Did the petition request a reclassification of a listed species? No

FOR PETITIONED CANDIDATE SPECIES:
a. Is listing warranted (if yes, see summary of threats below)? yes
b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? yes
c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded.

Higher priority listing actions, including court-approved settlements, court-ordered statutory deadlines for petition findings and listing determinations, emergency listing determinations, and responses to litigation, continue to preclude the proposed and final listing rules for Gierisch mallow. We continue to monitor Gierisch mallow populations and will change its status or implement an emergency listing if necessary. The "Progress on Revising the Lists" section of the current Candidate Notice of Review (CNOR) provides information on listing actions taken during the last 12 months.

___ Listing priority change
Former LP: ___
New LP: ___

Date when the species first became a Candidate (as currently defined): 12/10/2008

___ Candidate removal: Former LPN: ___
___ A – Taxon is more abundant or widespread than previously believed or not subject to

the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

___U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.

___ F – Range is no longer a U.S. territory.

___ I – Insufficient information exists on biological vulnerability and threats to support listing.

___ M – Taxon mistakenly included in past notice of review.

___ N – Taxon does not meet the Act's definition of "species."

___ X – Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Flowering Plants/Malvaceae (Mallow Family)

LAND OWNERSHIP: All known locations of the plant are on Bureau of Land Management (BLM) (Arizona Strip District and St. George Field Office, Utah) and Arizona State Land Department (ASLD) lands. There are nine known populations on a total of approximately 24.12 hectares (ha) (59.5 acres (ac)). Seven of these populations occur on approximately 22.3 ha (55 ac) of lands managed by BLM, Arizona Strip District. There is one population on approximately 0.81 ha (2 ac) of land managed by the ASLD, and one population on approximately 1.01 ha (2.5 ac) on BLM lands in Utah. Over 90 percent of the estimated population is found in Arizona, primarily on BLM lands.

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BIOLOGICAL INFORMATION

Species Description: *Sphaeralcea gierischii* (Gierisch mallow) is a perennial, flowering member of the mallow family. It produces few too many stems from a woody caudex (short, thickened, woody stem that is usually subterranean or at ground-level). The stems are 4.3 to 10.3 decimeters (dm) (1.4 to 3.4 feet (ft)) tall, and are often dark red-purple. The foliage is bright green and glabrous (not hairy). The leaf blades are 1.2 to 4 centimeters (cm) (0.47 to 1.57 inches (in)) long, 1 to 5 cm (0.4 to 1.9 in) wide; usually longer than wide. The leaves are ovate to cordate-ovate in outline, the base cordate to truncate, with 3 to 5 lobes. The inflorescence is panicle-like, with more than one flower per node. The calyx is 5 to 10 millimeters (mm) (0.2 to 0.4 in) long, green, uniformly glabrous, and the orange petals are 15 to 25 mm (0.6 to 0.98 in) long (Atwood and Welsh 2002, p. 161).

Taxonomy: *Sphaeralcea gierischii* is a recently described species (Atwood and Welsh 2002, p. 159). This species of mallow is distinguished from similar species, such as *Sphaeralcea rusbyi*, by the glabrous foliage, few or no stellate (star-shaped) hairs restricted to the leaf margins, larger flowers, and restricted range and habitat. Another closely related species is *S. moorei*; separating characters are the 3- to 5-parted narrow lobes, bright green leaves, and different habitat. As

discussed by the authors, the genus *Sphaeralcea* consists of taxa whose morphological distinctions are compromised by overlap of many characters. The characteristics of the mature fruiting carpels (seed-bearing structures) are one of the more important distinguishing characters, but specimens were rarely collected with mature carpels. Atwood and Welsh collected *Sphaeralcea* spp. in northern Arizona and southern Utah, and reviewed previous collections. The characteristics described in their 2002 taxonomic key allow for the discrimination of the related and similar taxa known to occur in southern Utah, and adjacent northern Arizona. The work was published in the peer reviewed journal *Novon*, which publishes short articles with the primary purpose of the establishment of nomenclature (scientific naming) of vascular plants. The authors are intimately familiar with the flora of Utah; Dr. Atwood is the Collections Manager of the S. L. Welsh Herbarium and Dr. Welsh is Emeritus Curator of Vascular Plants at Brigham Young University, Utah. After careful review of the 2002 Atwood and Welsh publication (which is the only information available at this time), it is our conclusion that *S. gierischii* is a valid taxon.

Habitat/Life History: *Sphaeralcea gierischii* is only found on gypsum outcrops associated with the Harrisburg Member of the Kaibab Formation in northern Mohave County, Arizona and closely adjacent Washington County, Utah (Atwood and Welsh 2002, p. 161). The surrounding plant community is that of warm desertscrub (Mohave desertscrub). We know very little about the life history of this species, since it was only recently described. We believe it is a perennial because it is woody at the base and the same individuals have been observed for more than one year. It dies back to the ground during the winter and re-sprouts from the base during late winter and spring (January to March), depending on daytime temperatures and rainfall. We do not know how the flowers are pollinated, the pollination system (self-pollinated or obligate out crosser), seed dispersal mechanisms, or the conditions under which seeds germinate. Young plants have been observed on reclaimed areas within the gypsum mining area (Service 2008, p. 1).

Historical Range/Distribution: There is no information on the historical range of this species. It is possible that the gypsum hills supported populations of *Sphaeralcea gierischii* before active mining (and removal of the gypsum) began, and there is also no information that the species occurred outside of its current range.

Current Range/Distribution: There are seven known populations restricted to less than 24.3 ha (60 ac) in Arizona and Utah, combined. The main populations in Arizona are located south of the Black Knolls, approximately 19.3 kilometers (km) (12 miles (mi)) southwest of St. George, Utah. There is one population approximately 4.8 km (3.0 mi) north of the main populations, on Arizona State trust lands. There is one population approximately 3.2 km (2 mi) north of the latter, on BLM lands in Utah. The Utah population is within 3.2 km (2 mi) of the Arizona/Utah border and the Arizona populations are within 11.3 km (7 mi) of the Arizona/Utah border. Figure 1 shows the range of the species in Arizona. Gypsum outcrops associated with the Harrisburg Member are scattered throughout BLM lands in northern Arizona and southern Utah. Extensive surveys were conducted in these areas because numerous other rare plant species are associated with these landforms (Atwood 2008, p. 1). *Sphaeralcea gierischii* was found only in this particular area.

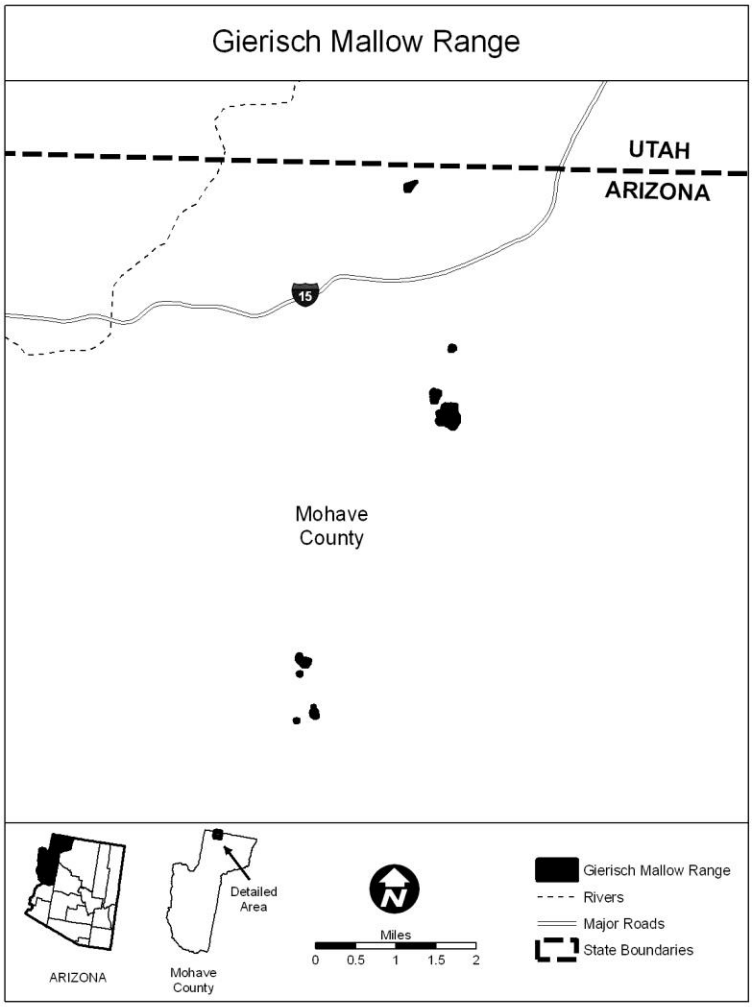

Figure 1. Current range of *Sphaeralcea gierischii* in Arizona.

Population Estimates/Status: Atwood and later Hughes (Service 2008, p. 5), estimated population size from four of the Arizona locations; the populations are referred to as "Hills" and three populations are on lands managed by the BLM, and one on lands managed by ASLD. Hughes (2009, p. 12-14) again estimated population sizes from transect data in 2009. There is a population on Hill 3, but there are no estimates for it. Data in Table 1 are from files in the BLM St. George field office and the Service's Arizona Ecological Services Office. In addition, Hughes set up belt transects on Hills 1, 2, 4, and 5. The actual transect counts appear in Table 1 in bold, in parenthesis. Surveys estimate total population size to be between 7,000 and 12,000 individuals in Arizona.

Table 1 Populations estimates/counts for *Sphaeralcea gierischii* from four locations in Arizona; transect counts are in bold and parentheses.

Location	Estimate/Count 2001	Estimate/Count 2003	Count 2007	Estimate/Count 2008	Estimate/Count 2009
Hill 1 (BLM)	150+ **(100)**	50 **(30)**	**(58)**	No data	300 **(155)**
Hill 2 (BLM)	150+ **(100)**	40 **(31)**	**(15)**	50 **(37)**	40 **(23)**
Hill 4 (BLM)	No data	5,000-9,000 **(180)**	**(176)**	**(65)**	No estimate **(108)**
Hill 5 (ASLD)	No data	2,000-3,000 **(115)**	No data	No data	No data

Total population size in Utah was estimated to be 200+ individuals in 2005 (Franklin 2007, p.1); in spring 2008 Hughes (BLM 2008b, p. 12) estimated the population to be between 5,000 and 8,000 individuals. The Utah population is not monitored on a regular basis. The Service plant ecologist and staff from the BLM Arizona strip office visited all of the known locations in February 2008 (Service 2008, p. 1). Population estimates were not made at this time because the plants were just emerging from winter dormancy, but there were plants present at all of the known locations visited. Hughes (2009, p. 15) again estimated the Utah population to be between 5,000 and 8,000 individuals in 2009.

Winter rainfall in 2008 produced many seedlings of *Sphaeralcea gierischii*. Higher densities were located within known locations in Arizona and Utah. No new populations have been found outside of the known areas. Estimates made in 2009 and transect counts have been added to Table 1. In addition to the information provided in Table 1, Hughes (BLM 2008b, p. 12) reported counts for transects he set up on two rehabilitated sites within the Western Mining and Minerals, Inc. gypsum operation, where 85 and 60 plants were counted on the two transects in 2008. Hughes (2009, p. 14) counted 50 and 32 plants on these sites in 2009.

THREATS

A. <u>The present or threatened destruction, modification, or curtailment of its habitat or range</u>:

Gypsum mining is an on-going source of habitat destruction for the *Sphaeralcea gierischii* in Arizona. Gypsum is used in construction, and for a variety of agricultural purposes. Gypsum deposits are found at various depths within the Harrisburg Member. Many of the most valuable gypsum deposits are not at ground level. This means that surface materials need to be removed and stockpiled, while the gypsum is mined from below. This type of activity completely removes the plant's habitat. The stockpiled surface material is then used to reclaim the area after the gypsum has been removed. There is an existing gypsum mining operation (Black Rock Gypsum Mine) affecting the Hill 4 population, the largest population in Arizona (BLM 2008a). The populations in the Hill 4 area are not restricted to one hill, but are scattered among several smaller hills that all contain gypsum outcrops. One of the larger deposits is currently being mined. A large amount of soil has been removed, but we do not know if the mallow was present on those areas before the mining activities started. However, there are other small hills within

the footprint of the mining claim that support the mallow. The BLM (Service 2008, p. 1) told us that Western Mining and Minerals, Inc. (the operator) has inquired about expanding the current operation; the area they would like to expand into supports the largest portion of the Hill 4 population, estimated in 2003 to be between 5,000 and 9,000 plants. The proposed expansion would remove the entire population and its habitat. We have received an Environmental Assessment for expansion of the quarrying activities within the Black Rock Gypsum Mine (BLM, 2008a), so we assume that the expansion will occur in the near future.

There is another gypsum mine, located near Hill 5, the second largest Arizona population. This mine, operated by Georgia-Pacific, is on ASLD lands. Service biologists were unable to visit this site in February 2008 due to lack of permission to enter the area. Habitat for the species may be affected by the operation, but we could not ascertain if this was the case. The removal of material was started several years ago and is very close to the population. The BLM indicated that there has not been mining activity at this location since 2007 (Service 2008, p. 1). Information provided by the ASLD, Division of Mining, indicated that the mineral lease was issued to Georgia-Pacific Gypsum Corp. on July 14, 2006, and is a 20-year lease. The lease encompasses 440 ac. They were not aware that there had been no recent activity on the lease; a recent decrease in construction may account for the observed lack of activity on the lease (Meier 2008, p. 1).

Gypsum mining is clearly a threat to this species and its habitat. The mining operation removes plants and habitat, and the reclaimed areas may or may not be suitable for the plants after the gypsum has been removed. A few individuals of *Sphaeralcea gierischii* were seen on reclaimed areas near Hill 4, but no information on the density of plants before the disturbance exists. Furthermore, it is unknown if restored areas will support the plants; restoration efforts with this species are currently being planned within the Black Rock Mine to assess the feasibility of seeding reclaimed areas with *Sphaeralcea gierischii* (Service 2008a, p. 1)

We believe that the on-going gypsum mining activities, authorized by the BLM and the ASLD, are a threat to this species and its habitat. Although there has been no mining activity on ASLD lands since 2007, the Service believes this inactivity is temporary and that mining will resume when the housing market improves over the next few years. There will be a significant reduction in the status of the species if the Western Mining and Minerals operation expands, and when mining activities resume at the Georgia-Pacific mine on lands managed by the ASLD. Those two locations support the largest numbers of plants. That would leave the other Arizona locations (Hills 1, 2, and 3) and the Utah population; those areas support fewer plants, and comprise approximately 5.7 ha (14 ac) of habitat. The loss of Hills 4 and 5 amounts to the loss of over 90 percent of the existing population and the long-term viability of the species would be compromised due to reduced reproductive potential and fragmentation. The limited distribution of this species, the small number of populations, limited amount of habitat, and its affinity for areas that support high-quality gypsum deposits, make it likely that *Sphaeralcea gierischii* populations and its habitat will remain threatened by mining in the near future.

The Utah population is not threatened by mining operations at this time, but we did see evidence of off-road vehicle (OHV) activity in the area. Several of the smaller hills were criss-crossed with OHV tracks. OHV use is increasing along with growth in St. George, Utah. Washington

County is projected to be one of the fastest growing counties in Utah, with a growth rate of 3.9 percent. The population of St. George has grown from 64,201 (2005) to 75,602 (2007) (St. George Area Chamber 2008, p. 2). The surrounding open spaces around St. George are ideal for OHV use because of the relatively flat terrain and ease of access. These areas are also used for target shooting and trash dumping. Evidence of both of these activities was present during our February 2008 visit. There was one large appliance dumped near the population, obviously used for target practice (Service 2008, p. 1). People engaging in target shooting near the population degrade habitat by trampling the soil and plants, and by driving vehicles on the habitat to access areas for target shooting. The unauthorized use of BLM lands for these activities can contribute to the degradation of habitat for *Sphaeralcea gierischii*. We consider continued unauthorized OHV use (off of designated roads), illegal dumping, and impacts associated with target shooting to be potential threats to this species and its habitat in Utah. We did not observe these activities near the Arizona populations.

B. Overutilization for commercial, recreational, scientific, or educational purposes.

There is no information available regarding threats related to overutilization for any purpose.

C. Disease or predation.

The flowering stalks of *Sphaeralcea gierischii* are eaten by livestock. All of the mallow populations on BLM lands are within grazing allotments. Herbivory has been documented by the BLM ecologist (Service 2008, p. 1) and Atwood (2008, p. 1). The mallow is eaten during drought years, when other forage is reduced or unavailable. The plant is also grazed during non-drought times, but not as heavily. Plants located near waters are also heavily browsed (Hughes 2008, p. 1). Atwood told us that when he was visiting the populations to collect fruit, he was unable to locate fruit because all of the flowering stalks had been chewed off by livestock. His survey work took place during drought years. The effect of sporadic grazing of plants is unknown, but persistent grazing can reduce the reproductive output of the plants, potentially reducing the size of the population. Hughes and Atwood have never seen a seedling in any of the populations on BLM lands (Service 2008, p. 1; Atwood 2008, p. 1).

We know of no disease that is affecting the plants.

D. The inadequacy of existing regulatory mechanisms.

The BLM has no regulatory authority for this species because it has no status under the Endangered Species Act. The BLM has not designated it as a sensitive species, and does not require conservation measures to protect the species and its habitat in the Mining Plans of Operation (MPO). The BLM is considering revision of their sensitive species list in 2008; they are considering adding this species to their list (Service 2008, p. 2). They have also indicated that they will be able to ask the mine operator to consider conservation measures, especially for the proposed mine expansion, for this species.

This species is not protected by the Arizona Native Plant Act (ANPA) because it is not on Arizona's list. Arizona will consider adding it to the list if the species becomes a candidate for

listing under the Act. Plants in the "Highly Safeguarded" category under the ANPA, include "plants resident to this state and listed as endangered, threatened, or category 1 in the federal endangered species act of 1973" (ANPA 1997, p. 4). The ANPA controls collecting, but provides no protection for plant habitat. There are no protections for other rare plant species that are found in the gypsum areas supporting the mallow.

E. Other natural or manmade factors affecting its continued existence.

We know of no other threats to the species at this time.

CONSERVATION MEASURES PLANNED OR IMPLEMENTED

No conservation measures have been implemented or planned for this species.

SUMMARY OF THREATS: In summary, *Sphaeralcea gierischii* is a newly described species restricted to certain gypsum outcrops in northern Arizona and southern Utah. The species is found on less than 24.3 ha (60 ac), and because there have been extensive searches it is unlikely that the species will be found in other locations. Surveys estimate total population size to be between 7,000 and 12,000 individuals. There are seven populations; all but one occur in Arizona. The largest populations in Arizona (Hills 4 and 5) are threatened by active gypsum mining. Hill 4, within an active claim on Arizona BLM lands, is also threatened by a proposed expansion of the gypsum mine. Other areas, now destroyed, within this mining claim may have supported *Sphaeralcea gierischii*, but we have no information on the plant's distribution prior to the mining activity. The other active gypsum mining claim, on ASLD land (Hill 5), apparently is inactive at this time, but production may start again at any time. The mining activity associated with both of these claims will destroy the species and its habitat in those areas. The removal of these two populations (Hills 4 and 5) would significantly impact the species because they comprise over 90 percent of the existing population, thus the long-term viability of the species would be compromised due to reduced reproductive potential and fragmentation. The species in Utah is not threatened to the same degree, but habitat degradation due to unauthorized OHV activity, trash dumping, and target shooting, is currently degrading the habitat. This type of activity will likely continue, if not increase, due to the proximity of St. George and its growing population. The species is not protected by the ANPL or by BLM policy, since it is not a listed sensitive species.

We find that *Sphaeralces gierischii* is warranted for listing throughout all its range, and, therefore, find that it is unnecessary to analyze whether it is threatened or endangered in a significant portion of its range.

For species that are being removed from candidate status:

___Is the removal based in whole or in part on one or more individual conservation efforts that you determined met the standards in the Policy for Evaluation of Conservation Efforts When Making Listing Decisions (PECE)?

RECOMMENDED CONSERVATION MEASURES: We recommend that the BLM evaluate the effects to this species and its habitat when reviewing proposed mining plans of operations

(MPOs), or expansions within existing mining claims. We recommend that mine operators store the topsoil, and use it for reclamation, so that if a seed bank for *Sphaeralcea gierischii* is present, some plants may be able to germinate and reclaim the disturbed area. We recommend research on the pollination, seed dispersal, and the effect of fragmentation on the remaining populations. We also recommend immediate protection for the remaining populations, by withdrawing the areas for mineral extraction. We recommend fencing and patrol for the population in Utah, to reduce habitat degradation. We also recommend fencing or livestock reduction near all populations to reduce the amount of herbivory, especially during drought. We find that this species is warranted for listing throughout all of its range, and, therefore, find that it is unnecessary to analyze whether it is threatened or endangered in a significant portion of its range.

LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	**Imminent**	Monotypic genus	1
		Species	**2***
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude: The known number of populations and the number of plants is small, and there is little likelihood that additional populations will be located due to the extensive surveys that have occurred. The species is threatened throughout its entire range in Arizona by gypsum mining, with the two largest populations in active mining operations. Loss of those populations would significantly reduce the total number of individuals throughout the range, threatening the long-term viability of this species. The continuation and expansion of gypsum mining activity in the range of the species will remove plants and habitat, and likely alter habitat such that it will no longer support the population as it exists today. In addition, livestock grazing occurs through this species' range. The species seems to be palatable to livestock, especially during dry periods and the apparent impact of persistent grazing is that it can reduce the reproductive output of the plants, potentially reducing the size of the population. Current grazing practices offer no

protection to this species. Thus, the overall magnitude of the threat is high.

Imminence: The mining threat is current; therefore the immediacy of the threat is imminent. Habitat and plants have already been removed from the current operation on Arizona BLM lands, and the operator has asked the BLM to consider an expansion that would remove most, if not all, of the largest population of this species. The operation on ASLD lands has started, and plants and habitat are within the footprint of the operation. Threats to the Utah population from unauthorized OHV use, trash dumping, and target shooting are on-going, but have not yet affected many habitat or plants. However, due to the proximity to St. George, these threats are likely to increase in the future. Threats from livestock grazing are also on-going, and occur throughout the species' range. The activities associated with the habitat degradation are likely to continue, and possibly increase, in the future. Thus, the threats are imminent.

__x__ Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed? Yes.

Is Emergency Listing Warranted? No, the status of the species is such that is will not go extinct during the normal listing process timeframes.

DESCRIPTION OF MONITORING: A monitoring program or protocol has not been developed for this species. Monitoring to date has consisted of site visits with population estimates, done on a sporadic basis.

COORDINATION WITH STATES: Indicate which State(s) (within the range of the species) provided information or comments on the species or latest species assessment: The Arizona Department of Agriculture reviewed this assessment, and had no comment. There is no Utah state agency that has jurisdiction over plants. The assessment was reviewed by Utah Natural Heritage, which provided information on the Utah population. This species is not part of the State of Arizona's Comprehensive Wildlife Plan because plants are not under the authority of the Arizona Game and Fish Department.

LITERATURE CITED

Arizona Native Plant Act and Antiquities Act. 1997. Arizona Department of Agriculture. Arizona Revised Statutes, Chapter 7. 27 pp.

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St. George Area Chamber. 2008. Population growth and projections for Washington County, Utah from *http://www.stgeorgechamber.com/EcDev/demographics.population.htm*. 3 pp.

U S. Fish and Wildlife Service (Service). 2008. Notes from office/field visit with Lee Hughes, Bureau of Land Management, February 12-13, 2008, including notes copied from BLM files 8pp. (summary located in files of the Tucson sub-office of U.S. Fish and Wildlife Service)

U S. Fish and Wildlife Service (Service). 2008a. Notes from a meeting with BLM and Western Mining and Minerals. September 17, 2008. 1 p.

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve: _____ May 21, 2010

Acting Regional Director, Fish and Wildlife Service Date

Concur: _____ Date: October 22, 2010

ACTING

Director, Fish and Wildlife Service

Do not concur: _____ _____

Director, Fish and Wildlife Service Date

Director's Remarks:

Date of annual review: April2010
Conducted by:Mike Martinez